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10/796,305	03/10/2004	Gennadi Finkelshstein	P25032	9110
7055 7590 02/13/2008 GREENBLUM & BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191				
EXAMINER ALEJANDRO, RAYMOND				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
02/13/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com

pto@gbpatent.com

# Office Action Summary

**Application No.**

10/796,305

**Applicant(s)**

FINKELSHTEIN ET AL.

**Examiner**

Raymond Alejandro

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-117 is/are pending in the application.
- 4a) Of the above claim(s) 41-92 and 102-117 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40 and 93-101 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

This office action is responsive to the amendment filed 07/25/07. The applicant has overcome the objections, the 35 USC 112 rejection, and 35 USC 103 over Finkelshtain et al'876. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments. Therefore, the present claims are finally rejected over the same art as proffered hereinbelow on the written record:

### ***Election/Restrictions***

1. This application contains claims 41-92 and 102-117 drawn to an invention nonelected with traverse in the reply filed on 04/12/07. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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3. Claims 1-15, 17-19 and 29-35 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Finkelshtain et al 2003/0099876.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

As to claims 1 and 3-4:

Finkelshtain et al clearly anticipate the following claims:

Finkelshtain et al disclose a fuel cell (TITLE/ABSTRACT) that consists of an electrolyte chamber 12 that is bounded on either side of a cathode 14, and an anode 16 and that contains an electrolyte. Atmospheric oxygen reaches cathode 14. On the other side of an anode 16 from electrolyte chamber 12 is a fuel chamber 18 that contains a fuel solution (P0027). Liquid fuel such as methanol or a solution of  $\text{NaBH}_4$  is used (P0016, 0025, 0028) and a liquid solution of KOH is used as the electrolyte (P0028). *The liquid-tight sealing is an inherent characteristics of the fuel cell which uses liquid substances for operations.*

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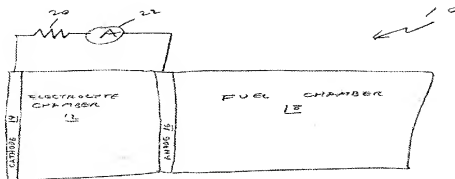


FIG. 1

As to claim 2:

Finkelshtain et al is not connected or attached to a fuel delivery system (See FIGURE 1).

As to claims 5-6:

Liquid fuel such as methanol or other alcohols such as butanol, propanol, ethanol, penthanol, hexanol and the likes are used (P0016-0017, 0025, 0038). Liquid fuel such as a solution of  $\text{NaBH}_4$  is used (P0016, 0025, 0028, 0037/CLAIMS 6 and 8).

6. The fuel composition of claim 5, wherein said first fuel is selected from the group consisting of  $\text{LiAlH}_4$ ,  $\text{NaBH}_4$ ,  $\text{LiBH}_4$ ,  $(\text{CH}_3)_3\text{NBH}_3$ ,  $\text{NaAlH}_4$ ,  $\text{NaCNBH}_3$ ,  $\text{CaH}_2$ ,  $\text{LiH}$ ,  $\text{NaH}$ ,  $\text{KH}$ ,  $\text{Na}_2\text{S}_2\text{O}_3$ ,  $\text{Na}_2\text{HPO}_4$ ,  $\text{Na}_2\text{LiPO}_2$ ,  $\text{K}_2\text{S}_2\text{O}_3$ ,  $\text{K}_2\text{HPO}_4$ ,  $\text{K}_2\text{HPO}_2$ ,  $\text{NaCOOH}$  and  $\text{KCOOH}$ .

7. The fuel composition of claim 1, wherein said first fuel is a hydride.

8. The fuel composition of claim 7, wherein said first fuel is selected from the group consisting of  $\text{LiAlH}_4$ ,  $\text{NaBH}_4$ ,  $\text{LiBH}_4$ ,  $(\text{CH}_3)_3\text{NBH}_3$ ,  $\text{NaAlH}_4$ ,  $\text{NaCNBH}_3$ ,  $\text{CaH}_2$ ,  $\text{LiH}$ ,  $\text{NaH}$  and  $\text{KH}$ .

As to claim 7:

A liquid solution of  $\text{KOH}$  is used as the electrolyte (P0028).

As to claim 8:

Atmospheric oxygen reaches cathode 14 (P0027). Thus, it is an air-breathing cathode.

As to claim 9:

A catalytic anode using Pt/Ru alloys catalytically oxidizes the fuel (P0004, 0010-0011).

As to claim 10:

No membrane is included in Finkelshtain et al's fuel cell (See FIGURE 1/P0027).

As to claims 11-14 and 17-18:

Volume of the fuel chamber 18 is  $15\text{ cm}^3$  (or 15 ml) (P0027). Volume of the electrolyte chamber 12 is  $2\text{ cm}^3$  (or 2 ml) (P0027). The sum of the above volumes is about  $17\text{ cm}^3$  (or 17 ml). Thus, it is within the claimed range.

As to claims 15 and 29:

It is apparent from **Figure 1** that the shape of the fuel cell is rectangular (See FIGURE 1). Cathode and anode surfaces also are parallel to each other (See FIGURE 1).

As to claims 19:

Area of each electrode is  $4\text{ cm}^2$  (P0027).

As to claims 30-35:

A fuel cell comprising multiple fuel cell units (i.e. a stack of fuel cells) necessarily includes more than one liquid fuel chamber, liquid electrolyte chamber and anodes and cathodes.

As a result, the present claims are anticipated.

4. (at least) Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being **clearly** anticipated by Thellamann 3365334.

Thellamann illustrates in **Figure 2** below a fuel cell having a liquid-tight seal (COL 1, lines 26-28) comprising electrodes 16, 19, and electrolyte chamber 23, a housing 10 and a fuel chamber 17 and an inlet pipe 21 permitting access of air into the cathode (COL 2, lines 17-62).

The electrolyte is a liquid electrolyte using an aqueous solution of KOH (COL 1, lines 17-18).

*The structure of the fuel cell of Thellamann is the same fuel cell structure as instantly claimed.*

*Note: although Thellamann discloses the use of gaseous fuel, it is to be noted that if a liquid fuel is supplied into fuel chamber 17, said chamber is configured to or capable of retaining the liquid fuel as instantly claimed. Notice that the requirement of the present claims is “configured to retain liquid fuel”.*

FIG.1

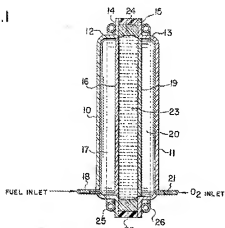


FIG. 2

As a result, the present claims are anticipated.

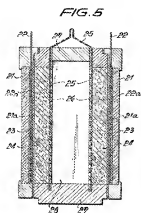
5. (at least) Claims 1, 5 and 7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Vielstich et al 3365333.

As to claim 1:

Vielstich et al illustrate in Figure 5 below a fuel cell comprising oxygen electrodes 21, fuel electrodes 24, a fuel/electrolyte chamber 26 and a multipart holder 27 for holding the fuel cell (COL 4, lines 22-55). Vielstich et al use a liquid fuel and a liquid electrolyte (COL 1, lines

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15-30/EXAMPLES 1-4). A solution of KOH is the electrolyte (EXAMPLES 1 and 3). Methanol is the fuel (EXAMPLE 4).



*Note: The structure of the fuel cell of Vielstich et al is the same fuel cell structure as instantly claimed when taking the two oxygen electrodes 21 and the two fuel electrodes 24 as one oxygen electrode and one fuel electrode as a whole, respectively. The specific first chamber position is met when combining one electrode on the right side with one on the left side; similarly, the specific second chamber is met when combining the one electrode on the right side with the other electrode on the left side. Therefore, it meets the specific structural orientation claimed by the applicant. Additionally, there is no requirement that first and second chambers are two separate and different chambers and/or fully dedicated to either fuel or an electrolyte. Thus, fuel/electrolyte chamber 26 meets the functional requirement of being configured to retain liquid fuel and liquid electrolyte as instantly claimed.*

As to claims 5 and 7:

A solution of KOH is the electrolyte (EXAMPLES 1 and 3). Methanol is the fuel (EXAMPLE 4).

As a result, the present claims are anticipated.

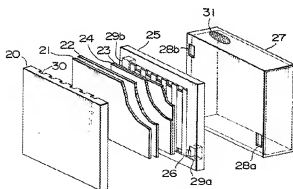


6. (at least) Claims 1, 5, 7, 39 and 93 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Shimizu et al 4562123.

As to claims 1, 39 and 93:

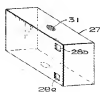
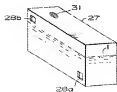
Shimizu et al illustrate in **Figure 1** below a fuel cell comprising an air electrode 21, a methanol electrodes 23, an ion exchange membrane 22 and a methanol tank 27 (See FIGURE 1/COL 8, lines 52-65) satisfying the structural orientation claimed by the applicant. **Figure 5** illustrates the fuel cell container as a whole (FIGURE 5). An electrolyte containing an aqueous solution of KOH and liquid fuel such as methanol are used (COL 1, lines 40-50/COL 4, line 1 & lines 28-30/COL 5, line 65/COL 6, lines 6-15/Col 7, line10-12/COL 7, line 68 to COL 8, line 2).

**FIG. 1**



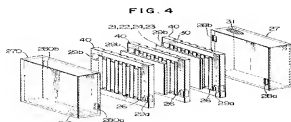
**FIG. 2**

**FIG. 3**



Reference numerals 28a, 28b and 29a, 29b represent holes allowing the flow of methanol into the fuel chamber and gas produced at the electrode out of the fuel chamber (COL 9, lines 35-44). Reference numeral 31 is a vent port (COL 10, lines 27-35).

**Figure 4** is a fuel cell configuration with dual methanol tanks 27. *Thus, it contains a plurality of holes 28a, 28b, 280a, 280b and 29a, 29b, 290a, 290b and vents 31, 310.*



Shimizu et al mention in multiple times the use of a liquid electrolyte (COL 1, lines 40-50/COL 6, lines 6-15/COL 7, line10-12/COL 7, line 68 to COL 8, line 2). *Note: it fully expectable that when a liquid electrolyte is employed, the structure containing the liquid electrolyte has the same structure/configuration as the tank 27 containing the liquid fuel. Thus, Shimizu et al enable the skilled artisan to employ an electrolyte chamber for holding a liquid electrolyte.*

As to claims 5 and 7:

An electrolyte containing an aqueous solution of KOH and liquid fuel such as methanol are used (COL 1, lines 40-50/COL 4, line 1 & lines 28-30/COL 5, line 65/COL 6, lines 6-15/COL 7, line10-12).

As a result, the present claims are anticipated.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 24-28 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over: a) Thellamann 3365334; and/or b) Vielstich et al 3365333; and/or c) Shimizu et al 4562123 as applied to claim 1 above, and further in view of Ricks et al 2004/0175599.

Thellamann, and/or Vielstich et al and/or Shimizu et al are all applied, argued and incorporated herein for the reasons discussed above. However, the preceding reference fails to disclose the specific ports and openings.

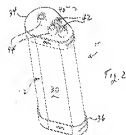
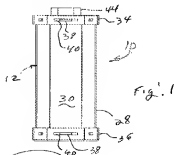
As to claims 24-28 and 36:

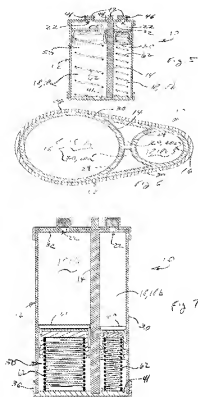
**Figures 1-2 and 5-7** below of Ricks et al illustrate a fuel cell replenishment system using a cartridge (TITLE/ABSTRACT) and having a casing extending around an interior space, the

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casing has a partition that defines an infeed chamber and an outfeed chamber within the interior space; the partition has an access channel that extends between the infeed and outfeed chambers; the chambers each have a port (ABSTRACT/P0025-0032, 0007). The replenisher can have fuel chambers as well as electrolyte chambers (P0028). A re-closing seal is disclosed (P0032). Septum 42 reseals after withdrawing cannula 48 (P0034).

In one embodiment, the casing 12 has two pair 16 of chambers 18, 20; the first pair 16 includes an infeed fuel chamber 18a, and an outfeed fuel chamber 20a; the second pair 16 includes an infeed electrolyte chamber 18b and an outfeed electrolyte chamber 20b (P0026). Infeed and outfeed chambers 18a, 20a are connected by an access channel 24. Auxiliary channels can provide communication between all chambers of the same type or only between some of the chambers (P0028).





In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the specific ports and openings of Ricks et al in the fuel cell of Thellamann, and/or Vielstich et al and/or Shimizu et al, when having ports incorporated into their fuel cell structure, as Ricks et al disclose their invention allow easy and convenient replenishment of one or more solutions of a fuel cell without use of additional equipment.

11. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over: a) Thellamann 3365334; and/or b) Vielstich et al 3365333; and/or c) Shimizu et al 4562123 as applied to claim 1 above.

Thellmann, and/or Vielstich et al and/or Shimizu et al are all applied, argued and incorporated herein for the reasons discussed above. Nonetheless, the preceding references fail to disclose the specific outer dimensions or does not expressly disclose the specific rectangular shape (*assuming arguendo that the representation of Figure 1 is inaccurate*).

Thellmann discloses and illustrates a shaped fuel cell housing with certain dimensions (COL 2, lines 17-20/ FIGURE 2).

Vielstich et al discloses and illustrates a shaped fuel cell arrangement comprising an enclosing holder with certain dimensions (COL 4, lines 22-55/ FIGURE 5).

Shimizu et al discloses and illustrates a shaped arrangement of fuel cell units with certain dimensions (FIGURES 1 & 2).

*Thus, all of the above fuel cell systems disclosed by the preceding references have outer dimensions but it is unknown or undisclosed.*

On this subject, where the only difference between the prior art and the claims is a recitation of relative dimensions *changes in size/proportion* of the claimed feature and a feature having the claimed relative dimensions would not perform differently than the prior art device, element, or member, the claimed device/element/member is not patentably distinct from the prior art device, element, or member. That is, limitations relating to the size of the feature/element/member are not sufficient to patentably distinguish over the prior art as it is noted that changes in size is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular size of the claimed outer dimension is significant. In re Rose 105 USPQ 237; In re Rinehart 189 USPQ 143; In Gardner v.

TEC Systems, Inc., 220 USPQ 777 & 225 USPQ 232, (See MPEP 2144.04 [R-1] Legal

**Precedent as Source of Supporting Rationale)**

With respect to the rectangular shape, it is noted changes in shape is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed fuel cell casing is significant. In re Dailey, 149 USPQ 47. It is also noted that aesthetic design changes having no mechanical function cannot be relied upon to patentably distinguish the claimed invention from the prior art. In re Seid, 73 USPQ 431. (See MPEP 2144.04 [R-1] Legal Precedent as Source of Supporting Rationale)

12. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over : a) Thellamann 3365334; and/or b) Vielstich et al 3365333; and/or c) Shimizu et al 4562123 as applied to claim 1 above, and further in view of Finelli 3880809.

Thellamann, and/or Vielstich et al and/or Shimizu et al are all applied, argued and incorporated herein for the reasons discussed above. However, the preceding reference fails to disclose the specific plastic casing.

Finelli discloses a fuel cell container having resistance to hydrocarbon materials formed of a polyurethane (COL 2, lines 7-10/ ABSTRACT/TITLE).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the specific plastic casing of Finelli in the fuel cell of Thellamann, and/or Vielstich et al and/or Shimizu et al as Finelli teaches that his specific plastic casing (polyurethane container) has an excellent resistance to hydrocarbon materials, excellent abrasion resistance, oil resistance, tensile strength and made

essentially free of any tendency to become brittle; and it can also withstand normal impact forces while being used or transported.

13. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over: a) Thellamann 3365334; and/or b) Vielstich et al 3365333; and/or c) Shimizu et al 4562123 as applied to claim 1 above, and further in view of Delfino et al 3288644.

Thellamann, and/or Vielstich et al and/or Shimizu et al are all applied, argued and incorporated herein for the reasons discussed above. However, the preceding reference fails to disclose the specific metal casing.

Delfino et al disclose a fuel cell module casing providing a liquid-tight seal made of metal (CLAIM 1/COL 4, line 16) such as Ni because it withstands the corrosive influence of the electrolyte (high resistance to corrosion) and its availability (COL 4, line 63-67).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the specific metal casing of Delfino et al in the fuel cell of Thellamann, and/or Vielstich et al and/or Shimizu et al as Delfino et al teach that metal casings made of Ni are desirable because such a metal withstands the corrosive influence of the electrolyte (high resistance to corrosion) and its availability (COL 4, line 63-67).

14. Claims 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over: a) Thellamann 3365334; and/or b) Vielstich et al 3365333; and/or c) Shimizu et al 4562123 as applied to claim 1 above, and further in view of Reiser 2003/0207162.



Thellamann, and/or Vielstich et al and/or Shimizu et al are all applied, argued and incorporated herein for the reasons discussed above. However, the preceding reference fails to disclose the specific ancillary power supply device.

Reiser discloses a battery boosted fuel cell (TITLE) wherein the fuel cell has an auxiliary power source (ABSTRACT) such as a supercapacitor (P0006).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the specific ancillary power supply device of Reiser in the fuel cell of Thellamann, and/or Vielstich et al and/or Shimizu et al as Reiser teach his specific ancillary power supply device (i.e. supercapacitor) assists the fuel cell in providing additional energy when necessary. Thus, the performance of the fuel cell is enhanced.

15. Claims 39-40 and 93-101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thellmann 3365334 in view of Ricks et al 2004/0175599.

As to claim 39 and 93:

Thellamann illustrates in **Figure 2** below a fuel cell having a liquid-tight seal (COL 1, lines 26-28) comprising electrodes 16, 19, and electrolyte chamber 23, a housing 10 and a fuel chamber 17 and an inlet pipe 21 permitting access of air into the cathode (COL 2, lines 17-62). The electrolyte is a liquid electrolyte using an aqueous solution of KOH (COL 1, lines 17-18).

*The structure of the fuel cell of Thellamann is the same fuel cell structure as instantly claimed.*

*Note: although Thellamann discloses the use of gaseous fuel, it is to be noted that if a liquid fuel is supplied into fuel chamber 17, said chamber is configured to or capable of retaining the liquid*

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*fuel as instantly claimed. Notice that the requirement of the present claims is “configured to retain liquid fuel”.*

FIG.1

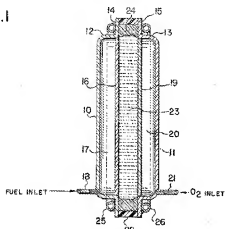


FIG.2

Thellmann disclose a fuel cell system as seen and described above. Nonetheless, the preceding prior art fails to disclose the sealable openings and the specific cartridge removably connected to the fuel cell.

As to claims 39-40, 93-95 and 98:

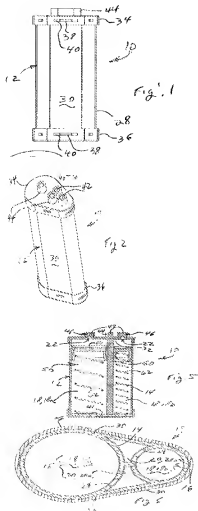
**Figures 1-2 and 5-7** below of Ricks et al illustrate a fuel cell replenishment system using a cartridge (TITLE/ABSTRACT) and having a casing extending around an interior space, the casing has a partition that defines an infeed chamber and an outfeed chamber within the interior space; the partition has an access channel that extends between the infeed and outfeed chambers; the chambers each have a port (ABSTRACT/P0025-0032, 0007). The replenisher can have fuel chambers as well as electrolyte chambers (P0028). A re-closing seal is disclosed (P0032). Septum 42 reseals after withdrawing cannula 48 (P0034).

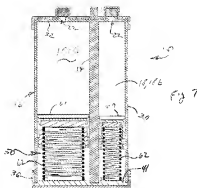
In one embodiment, the casing 12 has two pair 16 of chambers 18, 20; the first pair 16 includes an infeed fuel chamber 18a, and an outfeed fuel chamber 20a; the second pair 16

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includes an infeed electrolyte chamber 18b and an outfeed electrolyte chamber 20b (P0026).

Infeed and outfeed chambers 18a, 20a are connected by an access channel 24. Auxiliary channels can provide communication between all chambers of the same type or only between some of the chambers (P0028).





As to claims 96-97:

The combination of reference numerals, inter alia, 24 (access channel), 26 (auxiliary channels), 50 (biaser), 60 (piston), 62 (spring) and 42 (septum) and 48 (cannula) can be said to provide the necessary arrangement to reduce turbulence. Septum 42 reseals after withdrawing cannula 48 (P0034). *Thus, it represents a layer of permeable material.*

As to claims 99-100:

A seal 41 can be provided to prevent leakage (P0031). *It is noted that this seal may act as absorbent material as well.*

As to claim 101:

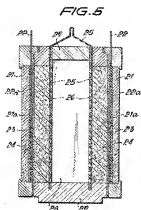
A locking mechanism is described (P0031/FIGURE 1).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the specific cartridge removably connected to the fuel cell and its sealable openings of Ricks et al in the fuel cell of Thellmann as Ricks et al disclose their invention allow easy and convenient replenishment of one or more solutions of a fuel cell without use of additional equipment.

16. Claims 39-40 and 93-101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vielstich et al 3365333 in view of Ricks et al 2004/0175599.

As to claim 39 and 93:

Vielstich et al illustrate in **Figure 5** below a fuel cell comprising oxygen electrodes 21, fuel electrodes 24, a fuel/electrolyte chamber 26 and a multipart holder 27 for holding the fuel cell (COL 4, lines 22-55). Vielstich et al use a liquid fuel and a liquid electrolyte (COL 1, lines 15-30/EXAMPLES 1-4). A solution of KOH is the electrolyte (EXAMPLES 1 and 3). Methanol is the fuel (EXAMPLE 4).



*Note: The structure of the fuel cell of Vielstich et al is the same fuel cell structure as instantly claimed when taking the two oxygen electrodes 21 and the two fuel electrodes 24 as one oxygen electrode and one fuel electrode as a whole, respectively. The specific first chamber position is met when combining one electrode on the right side with one on the left side; similarly, the specific second chamber is met when combining the one electrode on the right side with the other electrode on the left side. Therefore, it meets the specific structural orientation claimed by the applicant. Additionally, there is no requirement that first and second chambers are two separate and different chambers and/or fully dedicated to either fuel or an electrolyte.*

*Thus, fuel/electrolyte chamber 26 meets the functional requirement of being configured to retain liquid fuel and liquid electrolyte as instantly claimed.*

A solution of KOH is the electrolyte (EXAMPLES 1 and 3). Methanol is the fuel (EXAMPLE 4).

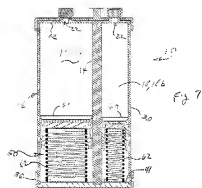
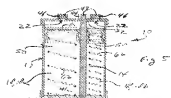
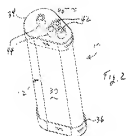
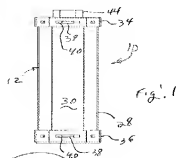
Finkelshtain et al disclose a fuel cell system as seen and described above. Nonetheless, the preceding prior art fails to disclose the sealable openings and the specific cartridge removably connected to the fuel cell.

As to claims 39-40, 93-95 and 98:

**Figures 1-2 and 5-7** below of Ricks et al illustrate a fuel cell replenishment system using a cartridge (TITLE/ABSTRACT) and having a casing extending around an interior space, the casing has a partition that defines an infeed chamber and an outfeed chamber within the interior space; the partition has an access channel that extends between the infeed and outfeed chambers; the chambers each have a port (ABSTRACT/P0025-0032, 0007). The replenisher can have fuel chambers as well as electrolyte chambers (P0028). A re-closing seal is disclosed (P0032). Septum 42 reseals after withdrawing cannula 48 (P0034).

In one embodiment, the casing 12 has two pair 16 of chambers 18, 20; the first pair 16 includes an infeed fuel chamber 18a, and an outfeed fuel chamber 20a; the second pair 16 includes an infeed electrolyte chamber 18b and an outfeed electrolyte chamber 20b (P0026). Infeed and outfeed chambers 18a, 20a are connected by an access channel 24. Auxiliary channels can provide communication between all chambers of the same type or only between some of the chambers (P0028).

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As to claims 96-97:

The combination of reference numerals, inter alia, 24 (access channel), 26 (auxiliary channels), 50 (biaser), 60 (piston), 62 (spring) and 42 (septum) and 48 (cannula) can be said to provide the necessary arrangement to reduce turbulence. Septum 42 reseals after withdrawing cannula 48 (P0034). *Thus, it represents a layer of permeable material.*

As to claims 99-100:

A seal 41 can be provided to prevent leakage (P0031). *It is noted that this seal may act as absorbent material as well.*

As to claim 101:

A locking mechanism is described (P0031/FIGURE 1).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the specific cartridge removably connected to the fuel cell and its sealable openings of Ricks et al in the fuel cell of Vielstich et al as Ricks et al disclose their invention allow easy and convenient replenishment of one or more solutions of a fuel cell without use of additional equipment.

17. Claims 40 and 94-101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al 4562123 as applied to claim 39 and 93 above, and further in view of Ricks et al 2004/0175599.

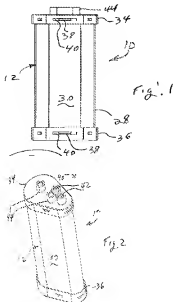
Shimizu et al disclose a fuel cell system as seen and described above. Nonetheless, the preceding prior art fails to disclose the sealable openings and the specific cartridge removably connected to the fuel cell.

As to claims 39-40, 93-95 and 98:

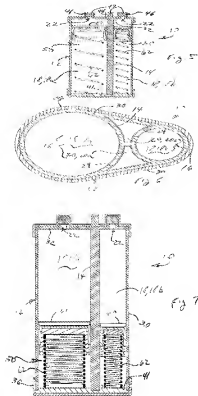


**Figures 1-2 and 5-7** below of Ricks et al illustrate a fuel cell replenishment system using a cartridge (TITLE/ABSTRACT) and having a casing extending around an interior space, the casing has a partition that defines an infeed chamber and an outfeed chamber within the interior space; the partition has an access channel that extends between the infeed and outfeed chambers; the chambers each have a port (ABSTRACT/P0025-0032, 0007). The replenisher can have fuel chambers as well as electrolyte chambers (P0028). A re-closing seal is disclosed (P0032). Septum 42 reseals after withdrawing cannula 48 (P0034).

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A locking mechanism is described (P0031/FIGURE 1).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the specific cartridge removably connected to the fuel cell and its sealable openings of Ricks et al in the fuel cell of Shimizu et al as Ricks et al disclose their invention allow easy and convenient replenishment of one or more solutions of a fuel cell without use of additional equipment.

### ***Response to Arguments***

18. Applicant's arguments filed 07/25/07 have been fully considered but they are not persuasive.

19. This response applies to all primary cited references (i.e. Finkelshtain et al; Thellamann; Vielstich et al; and Shimizu et al): the main contention of applicant's arguments is premised on the assertion that the art of record does not describe "*the fuel cell configured to at least one of receive fresh liquid and discharge spent liquid via at least one sealable opening*". In reply, it is first contended that the term "*sealable*" does not impart a positive limitation to the present claims, that is to say, it merely requires that the ports/openings, and/or ANY other fuel cell aperture or hole have the ability to be sealed. In this respect, it is apparent from reading the disclosure of the cited references, that ALL of the disclosed fuel cells are necessarily SEALED at least during normal operation, otherwise fuel leakage will occur leading to cause detrimental damages to either the fuel cell system or the fuel cell process. Furthermore, since the by-product of the fuel cell chemical process DOES include WATER, it is to be noted that liquid discharge is spent or exhausted from the fuel cell directly or indirectly through either an exhaust port and/or any other suitable opening appropriate for discharging exhaust therefrom. Since water is

produced in and exhausted from the fuel cell, all of the cited references fully satisfy the claimed requirement of being configured to at least discharge spent liquid as instantly claimed. Notice that the spent liquid has not been materially or compositionally defined to the extent of clearly distinguishing over the water discharged from the prior art references. As to Shimizu et al, the extent of the language "*being normally closed*" is uncertain, undefined and/or unknown so as to give it patentable weight to define over the teachings of Shimizu et al. Nonetheless, Shimizu et al uses sealable holes or points of contact for supplying fuel or allowing the flow of methanol; and it can be said that they are "normally closed" to avoid leakage of the fuel.

20. This response argument applies to the Thellmann reference: applicant has argued that the foregoing reference does not show "*a cathode exposed to the atmosphere*". The examiner largely disagrees. It is useful to note Thellmann's teaching about supplying either oxygen and/or AIR (See COL 1, lines 15-18). From this disclosure, the examiner further advances that since air is supplied into the cathode section/chamber of the fuel cell, that cathode section/chamber is indirectly exposed to the atmosphere through the air coming directly from the atmosphere. Thus, the air distribution configuration of Thellmann appropriately reads on applicant's invention as instantly claimed.

The foregoing Examiner's contention is based upon the assumption that applicant is intending to define the term "*atmosphere*" as the standard atmosphere (the outside air). However, a broader reasonable interpretation of the term "*atmosphere*" does not require the inclusion of air of the locality (the outside air = standard atmosphere). Suffice it to say the term "*atmosphere*" also encompasses the surrounding environment or immediate space enveloping or enclosing an element (not necessarily air from the atmosphere). From this perspective, Thellmann definitely

and unequivocally teaches the cathode being exposed to the surrounding environment or immediate space enclosing it. The present claims DO NOT HELP to differentiate one “*atmosphere- outside air*” from the other “*atmosphere-immediate surrounding environment or space*” as postulated above by the Examiner. These definitions of the term “*atmosphere*” has been taken from Merriam-Webster’s Collegiate Dictionary (10<sup>th</sup> Edition).

### ***Conclusion***

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Raymond Alejandro/  
Primary Examiner, Art Unit 1795